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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/022,834	02/13/1998	STEFAN DEGENDT	98.162	6138

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EXAMINER

AHMED, SHAMIM

ART UNIT PAPER NUMBER

1765

DATE MAILED: 01/30/2004

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Paper No. 20040112

Application Number: 09/022,834  
Filing Date: February 13, 1998  
Appellant(s): DEGENDT ET AL.

**MAILED**  
**JAN 30 2004**  
**GROUP 1700**

Michael S. Greenfield  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 11/6/03.

**(1) *Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

**(2) *Related Appeals and Interferences***

A statement identifying the related appeals and interferences, which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

**(3) *Status of Claims***

The statement of the status of the claims contained in the brief is correct.

**(4) *Status of Amendments After Final***

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) *Summary of Invention***

The summary of invention contained in the brief is correct.

**(6) *Issues***

The appellant's statement of the issues in the brief is correct.

**(7) *Grouping of Claims***

Appellant's brief includes a statement that claims 27-39 and 41-60 stand or fall together.

**(8) *Claims Appealed***

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) *Prior Art of Record***

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5,378,317 KASHIWASE et al. 01-1995

5,244,000 STANFORD et al. 9-1993

SEHESTED et al., "Decomposition of Ozone in Aqueous Acetic acid solution". J. Phys. Chem. 1992, 96, 1005-1009.

KERN, Werner, "Hand Book of Semiconductor Wafer Cleaning Technology", 1993, p.599-601.

**(10) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 27-28, 30-32,34-39, 41-43, 48-49, 51-54,57 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashiwase et al (5,378,317) in view of Sehested (J.Phys. Chem.)

Kashiwase et al disclose a method for removing organic film after an etching process wherein, substrates having the organic film emerged in an ozone- processing tank, in which ozone is injected as bubble into water.

As to claims 28,30-32 and 54, Kashiwase et al teach that the temperature in the ozone-processing tank is maintained at a preferable range of 40 to 100<sup>0</sup> C (col.4, lines 21-59).

As to claims 15-16,20 and 31, Kashiwase et al teach that after the ozone treatment the substrate is rinsed utilizing a fluid such ultra pure water (col.6, lines 26-32 and also see the example 6).

As to claim 35-36, kashiwase et al teach that organic contamination is a confined layer (col.5, lines 39-41).

As to claim 43, Kashiwase et al teach that ozone bubbles are contacted with the organic contaminants (col.4, lines 28-32).

Kashiwase et al remain silent about the introduction of an additive such as acetic acid acts as OH radical scavenger.

However, Sehested et al teach that acetic acid acts as OH radical scavenger in aqueous ozone solution to stabilize ozone in the solution (see the introduction, page 1005).

Sehested et al also teach that the concentration of acetic acid is less than 1% molar weight (see result section at page 1006).

Therefore, it would have been obvious to one skilled in the art at the time of claimed invention to combine Sehested et al's teaching into Kashiwase et al's method to stabilize ozone in the cleaning solution as taught by Sehested et al.

Claims 33,47 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashiwase et al (5,378,317) in view of Sehested (J.Phys. Chem.) as applied to claims 27-28, 30-32,34-39, 41-43, 48-49, 51-54,57 and 60 above, and further in view of Kern (Hand Book of Semiconductor Wafer Cleaning technology).

Kashiwase et al modified with Sehested et al discussed above but fail to teach the introduction of a megasonic agitation.

However, It would have been obvious to one having ordinary skill in the art at the time of claimed invention to incorporate megasonic agitation during cleaning process

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because it is mostly commonly used particle removal techniques for silicon wafer cleaning as taught by Kern (page 420, paragraph no. 5.3).

Therefore, it would have been obvious to one skill in the art at the time of claimed invention to combine Kern's teaching into modified Kashiwase et al's method because megasonic agitation in the cleaning solution would enhance the removal of the contaminants as taught by Kern.

Claims 29, 44-46,50 and 58-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashiwase (5,378,317) in view of Kern and Sehested et al (J. Phys.Chem.) as applied to claims 27,49 and 51 above, and further in view of Stanford et al (5,244,000).

Modified Kashiwase et al discussed above but fails to teach the rinsing step of the substrate after cleaning step and the liquid can be sprayed. However, Stanford et al. describe a method for removing organic contaminants in which, liquid can be sprayed (col.9, lines 10-13).

Stanford et al. Further describe that after the substrate is treated for removal of contaminants, carbon dioxide is added to deionized water, which is applied to rinse or neutralize the treated substrate (col.7, lines 11-22).

Therefore, it would have been obvious to one skill in the art at the time of claimed invention to combine Stanford et al's teaching into modified Kashiwase et al's method for effective removal of organic contaminants from a substrate as taught by Stanford et al.

Claim 49 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 27 of U.S. Patent No. 09/207,546.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the concentration of additive claimed in the application No. 09/207,546 is within the range of the instant application.

Obviousness-type double patenting rejection of claims 27, 51 and 60 are still effective as the previous Office action mailed 3/22/01 (see paragraph No. 7 and 8).

**(11) Response to Argument**

In appellants argument, appellants asserts that neither kashiwase et al nor Sehested et al, suggests that stabilization of ozone would lead to increase cleaning efficiency as observed by the present invention.

Appellants also argue that none of the cited prior art teaches or suggests that ozone decomposition plays any significant role in diminishing the cleaning efficiency of aqueous ozone.

In response to appellants's arguments, examiner states that the argument is not persuasive because Sehested et al teach that ozone is continuously decomposed to oxygen and acetic acid is a well-known stabilizer of aqueous ozone solution and also teach that acetic acid is added to ozone solution, wherein acetic acid retards the decomposition of ozone solution (see pages 1005-1006).

Since, ozone is continuously decomposes into the solution, this results the lowering of the concentration of ozone and obviously lower the cleaning efficiency of ozone in the solution.

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Therefore, one of ordinary skilled in the art at the time of claimed invention would have been motivated to add an additive such as acetic acid in order to stabilize ozone in the solution in order to restore the cleaning efficiency.

For the above reasons, it is believed that the rejections to the claims should be sustained.

In regards to the Double Patenting rejections, Appellant's response filed 11/06/03 is acknowledged that upon allowance of claims in the present application, applicants will submit a terminal disclaimer to obviate the obvious double patenting rejection.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Shamim Ahmed  
Examiner  
Art Unit 1765

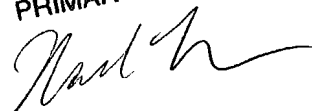
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